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EXAMINER	
PIZIALI, JEFFREY J	

ART UNIT	PAPER NUMBER
2629	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/657,854	MARTIN ET AL.	
	Examiner	Art Unit	
	Jeff Piziali	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 33-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 33-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on *17 July 2008* has been entered.

Information Disclosure Statement

2. The listing of references in the specification (*see, for instance, Paragraphs 30, 35, and 63 in the Specification*) is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. *Claims 2-7, 9-15, and 38* are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claims 2-7 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

An omitted structural cooperative relationship results from the claimed subject matter: "***a method***" (*claim 1, line 1*) and "***a method***" (*claims 2-7, line 1*).

It would be unclear to one having ordinary skill in the art whether the above limitations are intended to be identical to, or distinct from, one another.

6. Claim 6 recites the limitation "***the extent of motion of the manipulandum***" (*line 3*). There is insufficient antecedent basis for this limitation in the claim.

7. Claims 9-15 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

An omitted structural cooperative relationship results from the claimed subject matter: "***a device***" (*claim 8, line 1*) and "***a device***" (*claims 9-15, line 1*).

It would be unclear to one having ordinary skill in the art whether the above limitations are intended to be identical to, or distinct from, one another.

8. Claim 6 recites the limitation "***the extent of motion of the manipulandum***" (*line 3*). There is insufficient antecedent basis for this limitation in the claim.

9. Claim 12 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

An omitted structural cooperative relationship results from the claimed subject matter: "***a relative digital encoder***" (*claim 12, line 2*).

It would be unclear to one having ordinary skill in the art what the digital encoder is intended to be relative to.

10. Claim 14 recites the limitation "***the range of motion of the manipulandum***" (*line 2*). There is insufficient antecedent basis for this limitation in the claim.

11. Claim 14 recites the limitation "***the extent of motion of the manipulandum***" (*lines 3-4*). There is insufficient antecedent basis for this limitation in the claim.

12. Claim 38 recites the limitation "***the extent of motion of the manipulandum***" (*lines 3-4*). There is insufficient antecedent basis for this limitation in the claim.

13. The claims are rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

As a courtesy to the Applicant, the examiner has attempted to also make rejections over prior art -- based on the examiner's best guess interpretations of the invention that the Applicant is intending to claim.

However, the indefinite nature of the claimed subject matter naturally hinders the Office's ability to search and examine the application.

Any instantly distinguishing features and subject matter that the Applicant considers to be absent from the cited prior art is more than likely a result of the indefinite nature of the claims.

The Applicant is respectfully requested to correct the indefinite nature of the claims, which should going forward result in a more precise search and examination.

Claim Rejections - 35 USC § 101

14. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

15. *Claims 1-7* are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The "*method*" of claims 1-7 is not tied to a particular machine or apparatus, nor does the claimed "*method*" transform a particular article into a different state or thing.

16. *Claims 33-38* are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The "*computer-readable medium*" of claims 33-38 covers transitory inventive embodiments.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

19. *Claims 1-15 and 33-38* are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Delson et al (US 6,002,184 A)*** in view of the ***Osborne et al (US 6,005,551 A)***, ***Massie et al (US 5,625,576 A)***, and ***Roston et al (US 5,754,023 A)***.

Regarding claim 1, ***Delson*** discloses a method comprising:

receiving a sensor signal comprising a raw sensor value [*e.g., Fig. 21: x*] from a sensor [*e.g., Fig. 21: 2552*],

the raw sensor value associated with a position [*e.g., Fig. 21: actual output position x*] of a manipulandum [*e.g., Fig. 5A: 123*] in a range of motion;

calculating an adjusted sensor value [*e.g., Fig. 21:* δx] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

outputting an output signal comprising the adjusted sensor value (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Should it be shown that ***Delson*** discloses *calculating an adjusted sensor value*, as instantly claimed, with insufficient specificity:

Osborne discloses a method comprising:

receiving a sensor signal comprising a raw sensor value [*e.g., Fig. 3: x-axis, y-axis, throttle position*] from a sensor [*e.g., Fig. 2: 37; Fig. 3: 40*],

the raw sensor value associated with a position of a manipulandum [*e.g., Fig. 1: 13*] in a range of motion;

calculating an adjusted sensor value [*e.g., Fig. 4: 108*] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

outputting an output signal comprising the adjusted sensor value (*see the entire document, including Column 4, Line 8 - Column 10, Line 61*).

Delson and ***Osborne*** are analogous art, because they are from the shared inventive field of force feedback systems.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to combine ***Osborne's*** force effect rendering logic with ***Delson's*** control system, so as to reduce errors induced by noise while providing real-time rendering of effects.

Should it be shown that the combination of ***Delson*** and ***Osborne*** discloses a *manipulandum*, as instantly claimed, with insufficient specificity:

Massie discloses a method comprising:

receiving a sensor signal comprising a raw sensor value [*e.g., Fig. 5: pulses*] from a sensor [*e.g., Fig. 5: 550*],

the raw sensor value associated with a position of a manipulandum [*e.g., Fig. 5: 512*] in a range of motion;

calculating an adjusted sensor value [*e.g., Fig. 5: angles, representation of position, velocity, etc.*] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

outputting an output signal comprising the adjusted sensor value (*see the entire document, including Column 20, Line 8 - Column 22, Line 63*).

Delson, ***Osborne*** and ***Massie*** are analogous art, because they are from the shared inventive field of force feedback systems.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to combine ***Massie's*** linkage system with ***Osborne's*** and ***Delson's*** control system,

so as to facilitate a high fidelity position and torque or force feedback while minimizing backlash.

Should it be shown that the combination of ***Delson***, ***Osborne*** and ***Massie*** discloses an *output signal*, as instantly claimed, with insufficient specificity:

Roston discloses a method comprising:

receiving a sensor signal comprising a raw sensor value [*e.g., Fig. 5: y(t)*] from a sensor [*e.g., Fig. 4: sensors*],

the raw sensor value associated with a position of a manipulandum [*e.g., Fig. 24*] in a range of motion;

calculating an adjusted sensor value [*e.g., Fig. 5: e(t), u(t)*] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

outputting an output signal comprising the adjusted sensor value (*see the entire document, including Column 4, Line 20 - Column 21, Line 55*).

Delson, ***Osborne***, ***Massie*** and ***Roston*** are analogous art, because they are from the shared inventive field of force feedback systems.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to combine ***Roston's*** compensation techniques with ***Massie's***, ***Osborne's*** and ***Delson's*** control system, so as to stabilize the system while enhancing mobility.

Regarding claim 2, ***Delson*** discloses the compliance is associated with a compliance constant [*e.g., Fig. 21: K*] and a current output force [*e.g., Fig. 21: Xset*] (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Regarding claim 3, ***Delson*** discloses determining a closed-loop position-dependent force based at least in part on the raw sensor value (*see the entire document, including Fig. 21; Column 35, Line 35 - Column 36, Line 16*).

Regarding claim 4, ***Delson*** discloses transmitting forces from an actuator [*e.g., Fig. 21: 2524*] to the manipulandum (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Massie also discloses transmitting forces from an actuator [*e.g., Fig. 5: 540*] to the manipulandum with a belt drive [*e.g., Fig. 1: 126, 136*] (*see the entire document, including Column 8, Line 3 - Column 20, Line 7*).

Regarding claim 5, ***Delson*** discloses filtering the raw sensor value for overshoot sensor values occurring at limits to the range of motion of the manipulandum (*see the entire document, including Column 46, Lines 19-47*).

Osborne also discloses filtering [*e.g., Fig. 4: 108*] the raw sensor value for overshoot sensor values occurring at limits to the range of motion of the manipulandum (*see the entire document, including Column 4, Line 8 - Column 10, Line 61*).

Regarding claim 6, ***Delson*** discloses calibrating the range of motion of the manipulandum by adjusting minimum and maximum values of the range of motion based at least in part on the extent of motion of the manipulandum up to a designated time (*see the entire document, including Column 46, Lines 19-47*).

Osborne also discloses calibrating the range of motion of the manipulandum by adjusting minimum and maximum values of the range of motion based at least in part on the extent of motion of the manipulandum up to a designated time [*e.g., Fig. 4: 104*] (*see the entire document, including Column 4, Line 8 - Column 10, Line 61*).

Regarding claim 7, ***Delson*** discloses normalizing the raw sensor value to a normalized range of motion, wherein the adjusted sensor value is further associated with the normalized raw sensor value (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Osborne also discloses normalizing [*e.g., via Figs. 2, 3: MCU A/D conversion*] the raw sensor value to a normalized range of motion, wherein the adjusted sensor value is further associated with the normalized raw sensor value (*see the entire document, including Fig. 4; Column 4, Line 8 - Column 10, Line 61*).

Regarding claim 8, this claim is rejected by the reasoning applied in rejecting claim 1; furthermore, ***Delson*** discloses a device comprising:

a manipulandum [*e.g., Fig. 5A: 123*];

a linkage mechanism [*e.g., Fig. 5A: 110, 117*] providing a degree of freedom to the manipulandum;

a sensor [*e.g., Fig. 5A: 129; Fig. 21: 2552*] operable to sense a position of the manipulandum in the degree of freedom and to output a raw sensor value representing the position [*e.g., Fig. 21: actual output position x*]; and

a processor [*e.g., Fig. 21: digital computer 2530*], operable to:

receive a sensor signal from the sensor, the sensor signal comprising the raw sensor value;

calculate an adjusted sensor value [*e.g., Fig. 21: δx*] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

output an output signal comprising the adjusted sensor value (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Osborne discloses a device comprising:

a manipulandum [*e.g., Fig. 1: 13*];

a linkage mechanism providing a degree of freedom to the manipulandum;

a sensor [*e.g., Fig. 2: 37; Fig. 3: 40*] operable to sense a position of the manipulandum in the degree of freedom and to output a raw sensor value representing the position [*e.g., Fig. 3: x-axis, y-axis, throttle position*]; and

a processor [*e.g., Figs. 2, 3: MCU*], operable to:

receive a sensor signal from the sensor, the sensor signal comprising the raw sensor value;

calculate an adjusted sensor value [*e.g., Fig. 4: 108*] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

output an output signal comprising the adjusted sensor value (*see the entire document, including Column 4, Line 8 - Column 10, Line 61*).

Massie discloses a device comprising:

a manipulandum [*e.g., Fig. 2A: 202*];

a linkage mechanism [*e.g., Fig. 1*] providing a degree of freedom to the manipulandum;

a sensor [*e.g., Fig. 5: 550*] operable to sense a position of the manipulandum in the degree of freedom and to output a raw sensor value representing the position [*e.g., Fig. 5: pulses*]; and

a processor [*e.g., Fig. 5: 560, 562, 570, 580*], operable to:

receive a sensor signal from the sensor, the sensor signal comprising the raw sensor value;

calculate an adjusted sensor value [*e.g., Fig. 5: angles, representation of position, velocity, etc.*] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

output an output signal comprising the adjusted sensor value (*see the entire document, including Column 20, Line 8 - Column 22, Line 63*).

Roston discloses a device comprising:

a manipulandum [*e.g., Fig. 24*];

a linkage mechanism [*e.g., Fig. 2*] providing a degree of freedom to the manipulandum;

a sensor [*e.g., Fig. 4: sensors*] operable to sense a position of the manipulandum in the degree of freedom and to output a raw sensor value representing the position [*e.g., Fig. 5: y(t)*]; and

a processor [*e.g., Fig. 18: computer*], operable to:

receive a sensor signal from the sensor, the sensor signal comprising the raw sensor value;

calculate an adjusted sensor value [*e.g., Fig. 5: e(t), u(t)*] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

output an output signal comprising the adjusted sensor value (*see the entire document, including Column 4, Line 20 - Column 21, Line 55*).

Regarding claim 9, ***Delson*** discloses the linkage mechanism includes a chain of four rotatably-coupled members [*e.g., Fig. 5A: 105, 119, 121*] coupled to ground [*e.g., Fig. 5A: 102*]

at each end of the chain (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Regarding claim 10, ***Delson*** discloses an actuator [*e.g., Fig. 21: 2524*] coupled to the linkage mechanism,

the actuator operative to output a force in the degree of freedom (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Regarding claim 11, ***Delson*** discloses a drive transmission [*e.g., Fig. 5A: 101*] coupled between the actuator and the linkage mechanism (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Massie also discloses a belt drive transmission [*e.g., Fig. 1: 126, 136*] coupled between the actuator and the linkage mechanism (*see the entire document, including Column 8, Line 3 - Column 20, Line 7*).

Regarding claim 12, ***Delson*** discloses the sensor comprises a relative digital encoder (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Osborne also discloses the sensor comprises a relative digital encoder [*e.g., Figs. 2, 3: MCU A/D convertor*] (*see the entire document, including Column 4, Line 8 - Column 10, Line 61*).

Regarding claim 13, ***Delson*** discloses the sensor is coupled to the actuator such that the sensor is operable to detect rotation of a shaft of the actuator (*see the entire document, including Column 1, Lines 48-57*).

Regarding claim 14, ***Delson*** discloses the processor is operable to calibrate the range of motion of the manipulandum by adjusting minimum and maximum values of the range of motion based at least in part on the extent of motion of the manipulandum up to a designated time (*see the entire document, including Column 46, Lines 19-47*).

Osborne also the processor is operable to calibrate the range of motion of the manipulandum by adjusting minimum and maximum values of the range of motion based at least in part on the extent of motion of the manipulandum up to a designated time [*e.g., Fig. 4: 104*] (*see the entire document, including Column 4, Line 8 - Column 10, Line 61*).

Regarding claim 15, ***Delson*** discloses the processor is operable to determine a closed-loop force based at least in part on the raw sensor value (*see the entire document, including Fig. 21; Column 35, Line 35 - Column 36, Line 16*).

Regarding claim 33, this claim is rejected by the reasoning applied in rejecting claims 1 and 8; furthermore, ***Delson*** discloses a computer-readable medium on which is program code, comprising:

program code for receiving a sensor signal comprising a raw sensor value [*e.g., Fig. 21: actual output position x*] from a sensor [*e.g., Fig. 5A: 129; Fig. 21: 2552*],

the raw sensor value associated with a position of a manipulandum [*e.g., Fig. 5A: 123*] in a range of motion;

program code for calculating an adjusted sensor value [*e.g., Fig. 21: δx*] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

program code for outputting an output signal comprising the adjusted sensor value (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Osborne discloses a computer-readable medium on which is program code, comprising:

program code for receiving a sensor signal comprising a raw sensor value [*e.g., Fig. 3: x-axis, y-axis, throttle position*] from a sensor [*e.g., Fig. 2: 37; Fig. 3: 40*],

the raw sensor value associated with a position of a manipulandum [*e.g., Fig. 1: 13*] in a range of motion;

program code for calculating an adjusted sensor value [*e.g., Fig. 4: 108*] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

program code for outputting an output signal comprising the adjusted sensor value (*see the entire document, including Column 4, Line 8 - Column 10, Line 61*).

Massie discloses a computer-readable medium on which is program code, comprising:

program code for receiving a sensor signal comprising a raw sensor value [*e.g., Fig. 5: pulses*] from a sensor [*e.g., Fig. 5: 550*],

the raw sensor value associated with a position of a manipulandum [*e.g., Fig. 2A: 202*] in a range of motion;

program code for calculating an adjusted sensor value [*e.g., Fig. 5: angles, representation of position, velocity, etc.*] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

program code for outputting an output signal comprising the adjusted sensor value (*see the entire document, including Column 20, Line 8 - Column 22, Line 63*).

Roston discloses a computer-readable medium on which is program code, comprising:

program code for receiving a sensor signal comprising a raw sensor value [*e.g., Fig. 5: y(t)*] from a sensor [*e.g., Fig. 4: sensors*],

the raw sensor value associated with a position of a manipulandum [*e.g., Fig. 24*] in a range of motion;

program code for calculating an adjusted sensor value [*e.g., Fig. 5: e(t), u(t)*] based at least in part on the raw sensor value and a compliance between the sensor and the manipulandum; and

program code for outputting an output signal comprising the adjusted sensor value (*see the entire document, including Column 4, Line 20 - Column 21, Line 55*).

Regarding claim 34, ***Delson*** discloses the compliance is associated with a compliance constant [*e.g., Fig. 21: K*] and a current output force [*e.g., Fig. 21: Xset*] (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Regarding claim 35, ***Delson*** discloses program code for determining a closed-loop position-dependent force based at least in part on the raw sensor value (*see the entire document, including Column 35, Line 35 - Column 36, Line 16*).

Regarding claim 36, ***Delson*** discloses program code for transmitting forces from an actuator to the manipulandum with a belt drive (*see the entire document, including Fig. 21; Column 35, Line 35 - Column 36, Line 16*).

Regarding claim 37, ***Delson*** discloses program code for filtering the raw sensor value for overshoot sensor values occurring at limits to the range of motion of the manipulandum (*see the entire document, including Column 46, Lines 19-47*).

Osborne also discloses program code for filtering [*e.g., Fig. 4: 108*] the raw sensor value for overshoot sensor values occurring at limits to the range of motion of the manipulandum (*see the entire document, including Column 4, Line 8 - Column 10, Line 61*).

Regarding claim 38, ***Delson*** discloses program code for calibrating the range of motion of the manipulandum by adjusting minimum and maximum values of the range of motion based at least in part on the extent of motion of the manipulandum up to a designated time (*see the entire document, including Column 46, Lines 19-47*).

Osborne also discloses program code for calibrating the range of motion of the manipulandum by adjusting minimum and maximum values of the range of motion based at least in part on the extent of motion of the manipulandum up to a designated time [*e.g., Fig. 4: 104*] (*see the entire document, including Column 4, Line 8 - Column 10, Line 61*).

Response to Arguments

20. Applicant's arguments filed on *17 July 2008* have been fully considered but they are not persuasive.

Applicant's arguments with respect to *claims 1-15 and 33-38* have been considered but are moot in view of the new ground(s) of rejection.

By such reasoning, rejection of the claims is deemed necessary, proper, and thereby maintained at this time.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Piziali whose telephone number is (571)272-7678. The examiner can normally be reached on Monday - Friday (6:30AM - 3PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on (571) 272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeff Piziali/
Primary Examiner, Art Unit 2629
14 June 2010